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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,687	03/08/2001	Kaoru Sakai	16869P020000	6868

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EXAMINER	
KASSA, YOSEF	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/802,687	Applicant(s) CHOWANIC ET AL.	
	Examiner YOSEF KASSA	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,13-28,30,31,33,34 and 38* is/are rejected.

7)☒ Claim(s) *9-12,29,32 and 35-37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03/08/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 13-28, 30, 31, 33, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomimatu (U.S. Patent 5,792,580), and further in view of Matsuura et al (U.S. Patent 4,700,667).

With regard to claim 1, Tomimatu discloses a stage on which an object is mounted and which moves said object (see Fig. 1, item 109); a detector for detecting an image of said object on said stage (see col. 5, lines 1-6), image comprising a plurality of inspection image regions, i.e., shot region, and for outputting an image signal (see Fig. 1 item 101); and an image processing unit for receiving image signal, determining a plurality of offsets for said plurality of inspection image regions relative to a plurality of corresponding reference image regions (see col. 4, lines 45-52), and determining a selected offset out of a set of offsets of the plurality of offsets (see col. 5, lines 28-47); wherein set has at least one high reliability offset of plurality of offsets (see col. 4, lines 53-col. 5, lines 1-6).

While Tomimatu discloses shooting regions of wafer, he does not explicitly call for a detector device. However, in the same field of endeavor, Matsuura et al discloses a scanning means (see abstract). It would have been obvious to incorporate the

teaching of Matsuura et al plurality of image pattern scanning process into Tomimatu's system. The motivation for doing so is to detect a plurality of images of the pattern on wafer to be superposed one upon the other at a high speed and at high accuracy.

With regard to claim 2, Tomimatu discloses plurality of corresponding reference image regions are related to a time delayed plurality of inspection image regions (see col. 2, lines 53-67).

With regard to claim 3, Tomimatu discloses selected offset is used to align an entire inspection image and an entire reference image (see col. 4, lines 66-col. 5, lines 1-6).

With regard to claim 4, Tomimatu discloses a reliability of an offset of set is a high reliability offset if a pattern on an image region of first image regions is dense and is a low reliability offset if pattern is sparse (see col. 6, lines 16-32).

With regard to claim 5, Tomimatu discloses a reliability of an offset of set is evaluated by comparing offset with a predicted offset from past variations of offsets (see col. 5, lines 36-47).

With regard to claim 6, Tomimatu discloses detecting a plurality of inspection image regions (see col. 3, lines 41-44); an offset determining means for detecting offsets for plurality of inspection image regions (see col. 3, lines 45-49); an offset selection means for determining a selected offset with a high reliability from offsets (see col. 3, lines 49-54); and an alignment means for aligning an entire inspection image and an entire reference image using selected offset (see col. 5, lines 7-12).

While Tomimatu discloses shooting regions of wafer, he does not explicitly call for a detecting means. However, in the same field of endeavor, Matsuura et al discloses a scanning means (see abstract). It would have been obvious to incorporate the teaching of Matsuura et al plurality of image pattern scanning process into Tomimatu's system. The motivation for doing so is to detect a plurality of images of the pattern on wafer to be superposed one upon the other at a high speed and at high accuracy.

Claim 7 is similarly analyzed as claim 1. As to the additional limitation of dividing first image into a plurality of regions, and dividing second image into a plurality of corresponding regions (see col. 2, lines 49-61).

With regard to claim 8, Tomimatu discloses first region offset is an offset with a high reliability (see col. 2, lines 53-61).

With regard to claim 13, Tomimatu discloses images are received consecutively, full-image offset reliability is determined by comparing collected past offsets with high full-image offset reliability with image offset (see col. 3, lines 41-54).

Claim 14 is similarly analyzed as claim 1.

With regard to claim 15, Tomimatu discloses reliability value is based on a pattern density of said image (see col. 3, lines 41-54).

With regard to claim 16, Tomimatu discloses alignment error is critical, when alignment error results in a detection error (see col. 4, lines 53-65).

With regard to claim 17, Tomimatu discloses reliability is a full image offset reliability (see col. 4, lines 62-67).

With regard to claim 18, Tomimatu discloses reliability value is based on a pattern density of image (see col. 5, lines 16-26).

Claim 19 is similarly analyzed as claim 13.

With regard to claim 20, Tomimatu discloses predicted offset is derived using an extrapolation from a characteristic curve of past image offsets (see col. 6, lines 20-32).

Claim 21 is similarly analyzed as claim 20.

Claim 22 is similarly analyzed as claim 1.

Claim 23 is similarly analyzed as claim 8.

With regard to claim 24, Tomimatu discloses a selected offset of plurality of selected offsets is of high reliability, when a correlation matrix of selected offset has a largest value above a predetermined threshold (see col. 5, lines 27-46).

With regard to claim 25, Tomimatu discloses a reliability for a selected offset of plurality of selected offsets is determined using edge information in an associated sub-image of plurality of sub-images (see col. 3, lines 41-54).

Claims 26-28 are similarly analyzed as claims 18 and 24.

Claim 30 is similarly analyzed as claim 1.

Claim 31 is similarly analyzed as claim 3.

With regard to claim 33, Tomimatu is silent about a delay memory for storing corresponding portion. However, this feature taught by Matsuura (col. 4, lines 47-52). It would have been obvious to incorporate the teaching of Matsuura et al image data store process into Tomimatu's system. The motivation for doing so is to convert sampled image data into a digital value and store it into a memory.

Claim 34 is similarly analyzed as claim 8.

With regard to claim 36, Tomimatu discloses plurality of comparison channels operate in parallel (see Fig. 4).

Claim 37 is similarly analyzed as claim 24.

Claim 38 is similarly analyzed as claim 1.

Allowable Subject Matter

2. Claims 9-12, 29, 32 and 35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other Prior Art Cited

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent No. (6700667) to Nishi disclose exposure apparatus and method.

US Patent No. (5,923,403) to Jain disclose simultaneous two sided projection lithography system.

US Patent No. (4,742,376) to Phillips discloses step and repeat alignment anf exposure system.

US Patent No. (6,097,473) to Ota et al disclose exposure apparatus and positioning.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSEF KASSA whose telephone number is (703) 306-5918. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BHAVESH MEHTA can be reached on (703) 308-5246. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communication and (703) 872-9306 for after Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is (703) 306-5631. The group receptionist number for TC 2600 is (703) 305-4700.

PATENT EXAMINER

Yosef Kassa

05/12/04.

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600